

47-5 Patent Claims

1. A method of plasma etching, in particular of anisotropic plasma etching, of laterally defined structures in a silicon substrate, using a process gas, at least one passivating material being precipitated at least on the side walls of the laterally defined structures at least from time to time prior to and/or during etching, characterized in that a fluorine-delivering etching gas, containing at least one of the compounds selected from the group ClF_3 , BrF_3 , or IF_5 , is added, at least from time to time, to the process gas.
2. The method according to Claim 1, characterized in that at least one gas selected from the group SiF_4 , C_4F_8 , C_3F_8 , C_4F_{10} , C_3F_6 , or C_2F_6 , is also added to the process gas, at least from time to time, as the gas forming the passivating material.
3. The method according to Claim 1, characterized in that at least one gas selected from the group O_2 , N_2O , NO , NO_x , CO_2 , Ar , NO_2 , or N_2 is added, at least from time to time, to the process gas.
4. The method according to Claim 1, characterized in that at least one additive, in particular, CHF_3 , CF_4 , C_2F_6 , C_3F_8 , C_4F_8 , C_4F_{10} , C_3F_6 , a fluoroalkane, or NF_3 , consuming the passivating material, in particular, SiO_2 or a teflon-type material, is added, at least from time to time, to the process gas.
5. The method according to Claim 1, characterized in

that a light and easily ionizable gas, in particular H_2 , He, or Ne, is added, at least from time to time, to the process gas.

6. A method of plasma etching, in particular of anisotropic plasma etching, of laterally defined structures in a silicon substrate, using a process gas, at least one passivating material being precipitated at least on the side walls of the laterally defined structures at least from time to time prior to and/or during etching, characterized in that NF_3 is added to the process gas, at least from time to time, as an additive NF_3 consuming the passivating material, in particular, SiO_2 or a teflon-type material.

7. The method according to Claim 6, characterized in that a fluorine-delivering etching gas, containing at least one of the compounds selected from the group SF_6 , ClF_3 , BrF_3 , or IF_5 , is added, at least from time to time, to the process gas.

8. The method according to Claim 6, characterized in that at least one gas selected from the group SiF_4 , C_4F_8 , C_3F_8 , C_4F_{10} , C_3F_6 , or C_2F_6 is added to the process gas, at least from time to time, as the gas forming the passivating material.

9. The method according to Claim 6, characterized in that at least one gas selected from the group O_2 , N_2O , NO , NO_x , CO_2 , Ar, NO_2 , or N_2 is added, at least from time to time, to the process gas.

10. The method according to Claim 6, characterized in that a light and easily ionizable gas, in particular H_2 , He, or Ne, is added, at least from time to time, to the process gas.

11. A method of plasma etching, in particular of anisotropic plasma etching, of laterally defined structures in a silicon substrate, using a process gas, at least one passivating material being precipitated on the side walls of the laterally defined structures at least from time to time prior to and/or during etching, characterized in that a light and easily ionizable gas, in particular H_2 , He, or Ne, is added, at least from time to time, to the process gas.

12. The method according to Claim 11, characterized in that at least one fluorine-delivering etching gas, containing at least one of the compounds selected from the group SF_6 , ClF_3 , BrF_3 , or IF_5 , is added, at least from time to time, to the process gas.

13. The method according to Claim 11, characterized in that at least one gas selected from the group SiF_4 , C_4F_8 , C_3F_8 , C_4F_{10} , C_3F_6 , or C_2F_6 is added to the process gas, at least from time to time, as the gas forming the passivating material.

14. The method according to Claim 11, characterized in that at least one gas selected from the group O_2 , N_2O , NO, NO_x , CO_2 , Ar, NO_2 , or N_2 is added, at least from time to time, to the process gas.

15. The method according to Claim 11, characterized in that at least one additive, in particular, CHF_3 , CF_4 , C_2F_6 , C_3F_8 , C_4F_{10} , C_3F_8 , a fluoroalkane, or NF_3 , consuming the passivating material, in particular, SiO_2 , or a teflon-type material, is added, at least from time to time, to the process gas.

16. A method of plasma etching, in particular of anisotropic plasma etching, of laterally defined structures in a silicon substrate, using a process gas, at least one passivating material being precipitated on the side walls of the laterally defined structures at least from time to time prior to and/or during etching, characterized in that at least one fluorine-delivering etching gas, containing at least one of the compounds selected from the group ClF_3 , BrF_3 , or IF_5 , is added, at least from time to time, to the process gas; NF_3 is added to the process gas, at least from time to time, as an additive consuming the passivating material, and a light and easily ionizable gas, in particular H_2 , He , or Ne , is added, at least from time to time, to the process gas.

17. The method according to Claim 16, characterized in that at least one gas selected from the group SiF_4 , C_4F_8 , C_3F_8 , C_4F_{10} , C_3F_8 , or C_2F_6 is added to the process gas, at least from time to time, as the gas forming the passivating material.

18. The method according to Claim 16, characterized in that at least one gas selected from the group O_2 , N_2O , NO , NO_x , CO_2 , Ar , NO_2 , or N_2 is added, at least from time to time, to the process gas.